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ABSTRACT TITLE:

SRTM Metrology System: Preliminary Flight Results

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ABSTRACT TEXT:

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The Shuttle Radar Topography Mission (SRTM), developed by JPL in cooperation with DLR, NASA, and NIMA, was flown on the space shuttle Endeavor in February 2000. Operating as a fixed baseline Interferometric Synthetic Aperture Radar (IFSAR) instrument, SRTM acquired data which is currently being processed to generate an unprecedented digital elevation model covering 80% of the earth's land surface (latitudes from +60 to -55 deg) with an absolute height accuracy (1.6 sigma) requirement of 16 m at 30 m postings. In addition to SAR instruments based on prior shuttle radar projects, SRTM included the largest rigid structure ever flown in space - a 60 meter deployable mast - as well as a metrology system known as the Attitude and Orbit Determination Avionics (AODA). AODA was required to track the shuttle's orbit to 1 m accuracy and the inertial attitude and length of the interferometric baseline to an accuracy of 9 arcsec and 3 mm, respectively. We present a preliminary assessment of the AODA in-flight performance. A brief overview of the AODA system will be provided followed by some SRTM mission highlights. The performance of each sensor will then be discussed, based on in-flight observations and initial post-flight data reduction. The resulting AODA system error budget and the projected effect on the overall SRTM height accuracy will be presented. We will close with lessons-learned and recommendations for metrology systems on future spaceborne IFSAR instruments.

TOPIC PREFERENCE: F.8 (Interferometric SAR)